

Name: \_\_\_\_\_

Per: \_\_\_\_\_

## Atomic Structure Lab: Creating the Periodic Table

- Complete the square for each element by adding the atomic number, name, and atomic mass.
  - Write the atomic number at the top of the square.
  - Write the element's name under the symbol.
  - Write the atomic mass at the under the name.
- Determine the number of protons, neutrons, and electrons in each element.
- Create a Bohr diagram for each element.
- Draw the lewis structure for each element.
- Use the following colors to lightly shade in the square for each element. Be sure to only lightly shade so that the work previously done is not covered by the color and is clearly visible.

Green - Li &amp; Na

Orange - B &amp; Al

Red - C &amp; Si

Blue - Be &amp; Mg

Brown - N &amp; P

Purple - F &amp; Cl

Yellow - He, Ne &amp; Ar

Light Blue - O &amp; S

- Cut the cards apart and arrange according to atomic number and color on legal size piece of paper. Have the arrangement of the cards look like the image below.

1							2
3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18

- Answer the following questions based on observations you make for the periodic table you created.

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- Which elements have complete outer shells? Give the name and symbol.

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- What do you notice about the location of the elements in #1?

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3. Which elements have only one valence electron?

\_\_\_\_\_

4. What do you notice about the location of the elements in #3?

5. What happens to the number of valence electrons as you move from left to right across a row or period in the periodic table? (Na → Mg → Al → Si → P → S → Cl → Ar)

6. What happens to the number of energy level or shells as you move down a group or column in the periodic table? (H → Li → Na)

7. Elements are organized into families according to their physical and chemical properties. Identify the elements that belong to each family based on the number of valence electrons. Give the name and symbol for each element. Write the family name above each family on the periodic table you created.

Alkali Metals - 1 valence electron \_\_\_\_\_ & \_\_\_\_\_

Alkaline Earth Metals - 2 valence electron \_\_\_\_\_ & \_\_\_\_\_

Boron Family - 3 valence electron \_\_\_\_\_ & \_\_\_\_\_

Carbon Family - 4 valence electron \_\_\_\_\_ & \_\_\_\_\_

Nitrogen Family - 5 valence electron \_\_\_\_\_ & \_\_\_\_\_

Oxygen Family - 6 valence electron \_\_\_\_\_ & \_\_\_\_\_

Halogens - 7 valence electron \_\_\_\_\_ & \_\_\_\_\_

Noble Gases - 2/8 valence electron \_\_\_\_\_, \_\_\_\_\_ & \_\_\_\_\_

8. What do you notice about the location of the elements in each family?

9. What family would you classify hydrogen in? Why?

10. Predict the number of valence electrons for each element based on its location in the Periodic Table of Elements. You will need to use the table on the back of your schedule.

Barium: \_\_\_\_\_

Lead: \_\_\_\_\_

Xenon: \_\_\_\_\_

Potassium: \_\_\_\_\_

Name: \_\_\_\_\_

Per: \_\_\_\_\_

